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Free fatty acids profiling in olive oil and olives from the Trás-os-Montes Portuguese region

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Olive oil and olives are food products highly appreciated by consumers for both organoleptic (e.g. taste/flavour) and technological properties (i.e. cooking). Moreover, during the last years several research works have also reported presence of phenols, tocopherols, squalene, sterols and fatty acids (e.g. oleic acid) with important positive health effects (e.g. anti-inflammatory, antiarrhythmic and vasodilatory) [1]. Although free fatty acids (FFA) in olive oil are an important quality parameter, this analysis is highly challenging as it involves isolation, fractionation and derivatization steps. Interestingly, some studies suggest that free polyunsaturated FA can be recognized by GPR120 receptors triggering anti-inflammatory processes [2]. Thus, a single-step method for the FFA analysis in both biological and foodstuffs was recently developed by authors of this current work [3].

The Portuguese region of Trás-os-Montes is an important producer of high quality olive oil and olives but to date, its FFA composition has been poorly studied. The detailed composition of such nutritional parameter would help increase the value of these products to promote the region and the producers. Therefore, different monovarietal olive oils of Cobrançosa (n=2), Madural (n=2), Verdeal (n=5) and Santulhana (n=6) were collected, in duplicate, directly from various local olive mills. Corresponding olive samples were also obtained. The procedure described by Matyash *et al.* [4] was used for lipid isolation. FFA in all samples were analyzed by GC-FID as fatty acid methyl esters (FAME) according to the above commented method of Pimentel *et al.* [3].

Olive oil and olives had the same qualitative composition and oleic acid was the main FFA as expected. Results showed intra-varietal differences that may be associated to location. When compared with olives, oil elaboration decreased the concentration of all FFA as expected, but homogenized the composition of the assayed oils.

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